

A decorative graphic consisting of a grid of squares. Each square is divided into two triangles by a diagonal line. The squares are arranged in a staggered pattern. The colors are shades of grey and green. The bottom-right corner of the pattern is a solid green triangle.

BUYER'S GUIDE:

4G LTE for Critical Infrastructure



This buyer's guide was created to help engineers, operators, project managers and network administrators make intelligent decisions when evaluating 4G LTE wireless technology for use in Critical Infrastructure applications.

Remote equipment like meters, controllers, cameras and communication gear is expected to have a long working life, and evaluation teams know they will be living and working with the results of their decision for years to come. This guide will help give those teams confidence in the results of their decision.

Evaluation Categories and Key Considerations

Sec. 1 Cellular Network Support Questions	4
Do my remote locations have coverage on my preferred network?	4
What happens if the primary carrier has a network interruption?	4
Does the device have mechanisms to actively ping the cellular network to maintain a reliable connection?	4
Are there tools to help me visually see problems and be alerted when they happen?	4
Sec. 2 Router Performance and Reliability	5
Does the device have multi-carrier capability?	5
Does the device have a protocol analyzer tool for evaluating packet loss/delivery?	5
What additional protocols or assurances are part of the offering to assure connectivity and performance?	5
How easy is the device to install and operate?	5
Is the device rated for performance in harsh environments?	5
Sec. 3 Network & Security Architecture	6-7
Does the device have a stateful firewall?	6
Does the device support port isolation and VLAN tagging?	6
Can I disable or block unused services and ports?	6
Does the device support user authentication via RADIUS and TACACS+?	6
Does the device support VPN and encryption?	6
Does the device support event logging and alarming in the event of security breach?	6
Does the device include any physical security support?	6
Can you secure and synchronize the device configuration files?	7
Does the vendor provide application specific documentation to help with configuration?	7
Sec. 4 Remote Management Questions	7-8
Does the vendor have a centralized management tool?	7
Do we have to host, support and back up the tool?	7
We use a private cellular network – can I still use this tool?	7
Does the management tool help us troubleshoot problem devices?	7
Does the management tool support firmware updates?	8
Does the management tool support customized data reporting?	8
Does the management tool report temperature, CPU utilization and latency?	8
Is the management tool PCI certified?	8
Does the device support SNMP v2/v3?	8
Sec. 5 Total Cost of Ownership Questions	9
Does the vendor charge an additional annual fee for software?	9
Does the warranty term match our expected operational life?	9
If not, does the vendor charge for warranty extensions?	9
Does the vendor offer Technical Support in individual case packs & annual contracts, or do they only offer an annual contract?	9
Sec. 6 Vendor Compatibility Questions	9-10
How long has the vendor been in business?	9
Is the vendor publicly traded or privately held?	10
Is the vendor stable and profitable?	10
Is the vendor proactive in communicating life-cycle management actions like end-of-life notices?	10
Do the vendor’s geographic resources match our geographic needs and plans?	10
Is the vendor proactive in sharing applicable roadmap items and soliciting our feedback?	10
Sec. 7 Buyer’s Requirements Checklist	11

1 Cellular Network Support

1.1 Do my remote locations have coverage on my preferred network? If not, can I easily switch carriers?

- Most organizations designate a primary carrier and a secondary carrier for their deployments. The majority of devices go on Carrier A as the default, and Carrier B is only used when Carrier A's network isn't sufficient. Cellular routing hardware comes either "locked down" to a specific carrier—which means you'll need to buy and inventory multiple product types—or with a radio module that lets the user define which carrier network to connect to.
- The Digi TransPort® WR21, WR31 and WR44 use an embedded LTE module that supports the Gobi API, allowing them to be configured for nearly every network in the US and Canada.

1.2 What happens if the primary carrier has a network interruption?

- Backhoes, power interruptions, Acts of God—it's not unlikely that at some point your remote device will be unable to connect to its primary carrier.
- Digi TransPort WR routers have dual-SIMs, so users can designate a primary carrier, fail over to the backup carrier, and then return to the primary once service is re-established.

1.3 Does the device have mechanisms to actively ping the cellular network to maintain a reliable connection?

- Even during normal operation, it's not always easy for remote devices to stay connected to the nearest cell tower. Cellular networks go through maintenance and upgrades, and check for inactive devices, any of which can result in your device losing its connection.
- Digi TransPort routers use SureLink™, which employs mechanisms to monitor the health of the connection via active (e.g., pings) or passive techniques (via stateful firewall), then take corrective action via connection resets and reboots to help maintain connection persistency.

1.4 Are there tools to help me visually see problems and be alerted when they happen?

- Yes. Digi Remote ManagerSM provides visual feedback via its Health Reporting capabilities. Additionally, Digi TransPort routers have event alarming which can send alerts via email, SMS and/or SNMP.



Deploy and manage the WR31 with Digi Remote Manager software.

2

Router Performance and Reliability

2.1 Does the device have multi-carrier capability?

- With Gobi 4G LTE capabilities, Digi TransPort routers can easily be connected to Verizon, AT&T or Sprint 2G, 3G and 4G networks across North America using a single device. These routers can reliably connect a broad set of geographically distributed devices to allow scalability of M2M deployments, without worrying about what carrier and network type is best for each location.

2.2 Does the device have a protocol analyzer tool for evaluating packet loss/delivery?

- Digi TransPort routers include a comprehensive analyzer that allows for the inspection of traffic on virtually any interface or protocol within the router. This can be an invaluable tool when determining traffic flow and ensuring secure passage of data from one point to another.

2.3 What additional protocols or assurances are part of the offering to assure connectivity and performance?

- The WR31 offers enterprise routing features for security, logging and redundancy (e.g., stateful firewall, VPN, SNMP). It is the industry's only router that supports Digi's patented Virtual Router Redundancy Protocol (VRRP+) networking protocol, and offers Digi SureLink technology and dual SIM capabilities. Additionally, Digi SureLink ensures reliable persistent connections to wireless devices communicating through an "always-on" connection technology that mitigates connection losses through a programmable "inactivity timer" and a pro-active link integrity function. Finally, all Digi TransPort routers offer dual SIM to provide uninterrupted service through failover from one service provider to another which is essential for applications that require continuous network connectivity and must adhere to service level agreements (SLA).

2.4 How easy is the device to install and operate?

- Digi TransPort routers have a comprehensive WebUI built into each unit for configuration, backup and restore purposes. Additionally, a complete Command Line Interface (CLI) is included to allow for scripted configuration of hardware units. Digi TransPort routers even support SMS when it is included with a cellular plan, and CLI commands can be leveraged with routers via SMS as an out-of-band management mechanism.

2.5 Is the device rated for performance in harsh environments?

- With a ruggedized aluminum enclosure, the WR31 offers both DIN rail or shelf mounting for use in a variety of form factors including cabinets, weatherproof enclosures and substation sheds. It also meets American National Standards Institute (ANSI) National Electrical Code (NEC) classification for Hazardous Class 1/Division 2 deployments.
- The WR31 is designed to operate in operating temperatures of -30° C to +70° C and relative humidity of 5% to 95%. Through its I/O support for local sensing, the device is able to send alerts regarding physical changes in the deployment zone such as an open cabinet door, temperature change or moisture levels.

3

Network & Security Architecture

3.1 Does the device have a stateful firewall?

- All Digi TransPort routers come standard with a stateful firewall. This enterprise-level firewall provides customizable security and routing functionality.

3.2 Does the device support port isolation and VLAN tagging?

- Digi TransPort routers offer both port isolation and VLAN tagging to ensure that all traffic can be separated and routed, as needed. Static Routing is also available if certain traffic needs to traverse the different ports while port isolation is enabled.

3.3 Can I disable or block unused services and ports?

- All external services and ports can be disabled on the Digi TransPort routers to ensure physical security of the devices. Just remember, if you plan to disable all external services and ports, make you sure you leave a failsafe way to get into the unit so you do not completely lock yourself out!

3.4 Does the device support user authentication via RADIUS and TACACS+?

- All Digi TransPort routers support user authentication via RADIUS and TACACS+. A RADIUS client can be used for authentication purposes at the start of remote command sessions, SSH sessions, FTP sessions, HTTP sessions and Wi-Fi client connections; whereas, TACACS+ provides authentication, authorization, and accounting (AAA) services for ASY ports, telnet, SSH, FTP, HTTP/HTTPS and SNMP access methods.

3.5 Does the device support VPN and encryption?

- All Digi TransPort routers support multiple types of VPN connections and encryption methods. In regards to VPN, the routers support IPsec with IKEv1, IKEv2, and NAT Traversal; SSL, SSLv2, and SSLv3; FIPS 197; Open VPN client and server; and PPTP and L2TP. In regards to encryption, the routers support DES, 3DES, and AES up to 256-bit.

3.6 Does the device support event logging and alarming in the event of security breach?

- All Digi TransPort routers include a full-scale event log, analyzer trace tool and alarm/alert functionality. The event log and analyzer trace outputs can be downloaded via the User Interface, FTP or Digi Remote ManagerSM. Alarms can automatically alert a user via SNMP, SMTP and even SMS.

3.7 Does the device include any physical security support?

- On top of the ability to disable all physical interfaces, as mentioned above, some Digi TransPort models provide SIM covers, specialized screws, lockable enclosures, etc. to help with physical security. To take physical security one step further, alarms/alerts can be created based on power cycling, connectivity via physical interface, etc. The WR31 also has I/O functionality that can send an alarm based on an enclosure or cabinet door opening.

3.8 Can you secure and synchronize the device configuration files?

- Digi Remote Manager offers device profile management. This capability allows users to assign a “master” tag to one device configuration, sync all other devices’ configurations with the master’s configuration, and alert the user if those configurations become out-of-compliance.

3.9 Does the vendor provide application specific documentation to help with configuration?

- Digi has an extensive library of application-specific documentation to help with configuration; including, application notes that provide real-world, step-by-step instructions on how to configure a TransPort for specific applications. See <http://www.digi.com/support/supporttype?type=documentation> for access.

4 Remote Management

4.1 Does the vendor have a centralized management tool?

- When deploying cellular hardware in the field, it is critical to monitor the equipment and ensure that it remains secure. Digi Remote Manager is a security platform that allows users to centrally manage and monitor Digi hardware, as well as schedule tasks like firmware updates and configuration for after-hours completion.

4.2 Do we have to host, support and back up the tool?

- There is nothing for customers to install or support when using Digi Remote Manager since Digi provides the service as a securely hosted, ISO certified platform. The platform is constantly monitored and supported by Digi staff, and is available 24x7x365.

4.3 We use a private cellular network – can I still use this tool?

- You can use Digi Remote Manager with your Digi hardware, even when it is connected via private cellular connection (APN). Some options for achieving this connection include the following:
 - Web proxy
 - Firewall rule
 - VPN

4.4 Does the management tool help us troubleshoot problem devices?

- Digi Remote Manager enables customers to troubleshoot routers through the review device health metrics. Data Streams offer metrics both graphically and in raw data format while, as well as making the data available through a comprehensive API. The platform also provides a complete configuration interface for each device added to a customer account, and for Digi TransPort routers, a command line (terminal emulator) interface is included for even deeper interaction with devices.

4.5 Does the management tool support firmware updates?

- Most major security specifications mandate the regular update of device firmware as a consideration for keeping devices secure. Digi Remote Manager supports firmware updates to multiple devices in either an immediate or scheduled manner.

4.6 Does the management tool support customized data reporting?

- Device data reporting is supported by Digi Remote Manager, and reports can be customized to include or exclude the points that are considered most relevant. Additionally, with the included API, it is possible to extract data for any unit in formats such as XML and JSON for portal creation, and as an XLS file if a spreadsheet is needed.

4.7 Does the management tool report temperature, CPU utilization and latency?

- Sometimes a customer is concerned about the operational conditions of the routing hardware as much as the actual cellular performance. Digi Remote Manager provides information about much more than cellular data such as performance latency. It also includes elements such as router temperature, CPU utilization and available memory on the router.

4.8 Is the management tool PCI certified?

- PCI is a complex security standard specific to the processing of electronic payments, and when building a system around PCI regulations, the entire solution must be certified. As a component of a complete PCI solution, Digi Remote Manager is compliant with the PCI standard. Additionally, the platform is also compliant with HIPAA and NERC CIP security specifications.

4.9 Does the device support SNMP v2/v3?

- Digi TransPort routers support SNMP v2 and v3 for basic monitoring purposes. The standard was created to increase controls around cardholder data to reduce credit card fraud via its exposure. Some SNMP systems can be augmented by leveraging the available “push monitor” capabilities of Digi Remote Manager. Monitors allow customers to forward all hardware messages arriving in Digi Remote Manager to a “listener” running on other business systems, such as an SNMP platform. This capability can be leveraged to trigger process workflow such as support ticket creation.



The Payment Card Industry Data Security Standard was created to increase controls around cardholder data to reduce credit card fraud via its exposure.

5 Total Cost of Ownership

5.1 Does the vendor charge an additional annual fee for software?

- Many vendors charge an annual software license for the networking and security features required in critical infrastructure applications (see “Network and Security Architecture” above). Over the life of the product, these fees can surpass the purchase price of the hardware.
- Digi offers a full suite of enterprise software capabilities, including patented software features like VRRP+, Digi SureLink and RealPort®, at no additional cost.

5.2 Does the warranty term match our expected operational life?

- Critical infrastructure applications usually involve making a connection to an asset that will have a long field life: a meter, capacitor bank controller, traffic controller, etc. Calculate the difference between the expected useful life of the connected asset and the warranty of the LTE router. You can think of the difference between these two numbers as exposure—and you probably want to limit your exposure.
- Digi offers an industry-leading 5-year warranty on the WR21, WR31 and WR44.

5.3 If not, does the vendor charge for warranty extensions?

- Digi offers an industry-leading 5-year warranty on the WR21, WR31 and WR44.

5.4 Does the vendor offer Technical Support in individual case packs AND annual contracts, or do they only offer an annual contract?

- Vendors usually take one of two approaches in supporting industrial communications products. They either A) provide “free” tech support or B) require expensive annual support contracts. Option A has the unfortunate effect of making enterprise customers wait in the same queue as hobbyists and undergrads, and Option B doesn’t take into account the fact that many enterprise customers only need ad hoc support for problems, not an annual contract.
- Digi offers both annual enterprise support agreements as well as individual case packs, so customers can have either the assurance of knowing they can always connect directly with Digi Tech Support or the flexibility to purchase support when they need it.

6 Vendor Compatibility

6.1 How long has the vendor been in business?

- Cellular networks and the supporting technology change over time. You want to partner with a vendor who has “been there and done that” when it comes to the key elements: radio module support, international carrier certification, antenna design and testing, 2G-3G-4G network migration, firmware updates and security patches to name a few.

- Digi was founded in 1985; we launched the first commercially available cellular router and cellular device management software in 2004. We've worked with all of the major embedded radio module vendors, carriers and resale partners in the world. We also have a specialized engineering design group, Wireless Design Services, that designs and tests cellular products.

6.2 Is the vendor publicly traded or privately held?

- A publicly traded vendor is more likely to provide insight into how your particular product fits with their strategy—are you buying a hot product that the company is investing in, or a laggard that they may discontinue? A privately held vendor is more likely to go through abrupt changes in ownership or strategic direction, potentially stranding you with unsupported technology in the field.
- Digi has been publicly traded on the NASDAQ exchange since 1988 (symbol DGII).

6.3 Is the vendor stable and profitable?

- When you purchase industrial communication gear you are making a bet on the vendor. If they are publicly traded you can evaluate their liquidity with metrics like debt-to-equity or current ratio.
- Digi is a profitable, debt-free company with seasoned leadership and significant bench depth in key engineering, sales, support, operations and product management roles.

6.4 Is the vendor proactive in communicating life-cycle management actions like end-of-life notices?

- 3G/4G LTE equipment is comprised of several essential sub-components such as the embedded radio module, processor and power supply. When one of these sub-components “goes end-of-life” the clock is ticking for the vendor to find or build a replacement product.
- As mentioned above, Digi has over a decade of navigating technology changes and making it as easy and seamless as possible for customers.

6.5 Do the vendor's geographic resources match our geographic needs and plans?

- As anyone who has tried to use their cell phone overseas can tell you, operating cellular devices outside your home service area can be a challenge. Safety certification and import/export regulations only increase the challenge.
- Digi has 15 locations in 7 countries, and has sold cellular products in 95 countries around the world.

6.6 Is the vendor proactive in sharing applicable roadmap items and soliciting our feedback?

- Digi hosts quarterly Customer Advisory Board meetings and periodic user conferences to intentionally gather customer feedback.

Buyer's Requirements Checklist

Evaluation Category	Key Considerations	Digi	Vendor B	Vendor C
Product Performance & Reliability	Multi-carrier	✓		
	Ethernet ports	2		
	RS-232/422/485 serial	✓		
	Power input	9-30 VDC		
	Analog and digital I/O	✓		
	Operating temperature range	-30° C to 70° C		
	Electric grounding	✓		
	Mounting options	DIN or Wall		
	Warranty period	5 Years		
Cellular Network Support	Is the device certified to work on my primary network?	✓		
	Does the device fallback from the primary carrier to a secondary carrier?	✓		
	Can I switch the device to another cellular network once it's in the field?	✓		
	Are there tools to help me visually see problems and be alerted when they happen?	✓		
	Does the device actively ping the cellular network to maintain a reliable connection?	✓		
Network & Security Architecture	Does the device have a stateful firewall?	✓		
	Does the device support port isolation and VLAN tagging?	✓		
	Can I disable or block unused services and ports?	✓		
	Does the device support user authentication via RADIUS and TACACS+?	✓		
	Does the device support VPN and encryption?	✓		
	Does the device support event logging and alarming in the event of security breach?	✓		
	Does the device include any physical security support?	✓		
	Can you secure and synchronize the device configuration files?	✓		
Does the vendor provide application specific documentation to help with configuration?	✓			
Remote Management	Does the vendor have a centralized management tool?	✓		
	Do we have to host, support and back up the tool?	✓		
	We use a private cellular network – can I still use this tool?	✓		
	Does the management tool help us troubleshoot problem devices?	✓		
	Does the management tool support firmware updates?	✓		
	Does the management tool support customized data reporting?	✓		
	Does the management tool report temperature, CPU utilization and latency?	✓		
	Is the management tool PCI certified?	✓		
	Does the device have a protocol analyzer tool for evaluating packet loss/delivery?	✓		
	Does the device support SNMP v2/v3?	✓		
	Does the device have a useful, accessible WebUI and CLI?	✓		
Total Cost of Ownership	Does the vendor charge an additional annual fee for software?	No		
	Does the warranty term match our expected operational life?			
	If not, does the vendor charge for warranty extensions?	No		
	Does the vendor offer Technical Support in individual case packs AND annual contracts, or do they only offer an annual contract?	✓		
Vendor Compatibility	How long has the vendor been in business?	Est. 1985		
	Is the vendor publicly traded or privately held?	Public		
	Is the vendor stable and profitable?	✓		
	Is the vendor proactive in communicating life-cycle management actions like end-of-life notices?	✓		
	Is the vendor proactive in sharing applicable roadmap items and soliciting our feedback?	✓		
	Do the vendor's geographic resources match our geographic needs and plans?			

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